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REMARKS

Status of the Application:

Claims 3, 6–8, 11 and 12 are the claims of record of the application. Claims 3, 6–8, 11 and 12 have been rejected.

Claim Rejections - 35 USC § 103

In the office action, claims 3, 6–8, 11 and 12 have been rejected under 35 USC 103(a) as being unpatentable over previously cited Abel in view of Horbach (U.S. Patent 6,363,155) and further in view of previously cited Callahan, Jr. et al. (U.S. Patent 6,624,873, hereinafter "Callahan").

Applicant's invention clarified, yet again

The claimed aspects of the present invention deal with problems that occur when several (or a single) listeners—referred to in the claims as an audience—are at unknown locations in a room, e.g., a movie house that has three or more speakers on a side of a listener, to enhance the panning effect of a sound moving front to rear or rear to front, to add, in addition to the usual weighting of signals used for panning, time delays between the speakers, so that the audience, i.e., the listeners facing the front experience front to rear or rear to front movement of sound coming from the speakers that are to one side (or another) of the listeners substantially independently of their respective locations. Otherwise, the position of each listener would overly affect the quality of the panning experience. For example, with panning by amplitude weighting, a movie viewer sitting next to one of the speakers on the side would miss the panning effect.

Thus an aspect of Applicant's invention includes combining amplitude panning together with time delays applied to more than two speakers on one or the other side of an audience, i.e., listener(s) at unknown location(s) to provide the illusion of sound moving along the side of the listener(s), e.g., front to rear or rear to front while the listener is facing the front.

Presently, it is not known to combining amplitude panning and variable time delays for more than two speakers on one or the other side of a movie theater to produce rear -to-front or front-to-rear panning effects, even though this is a problem in present-day theaters.

The rejection

The Examiner has yet again stated that a **combination of three** patents renders the claims 3, 6–8, 11 and 12 obvious. Applicant respectfully disagrees. To combine three patents places a burden on the examiner to show suggestion and motivation in the references or inherently for combining the references. The Examiner has attempted to describe such motivation, and, as will be explained, has failed in this burden of proof required to show obviousness.

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The first reference is Abel. As can be seen from all the drawings of Abel, and the description, Abel deals with common surround sound systems. The reader is directed to FIG. 1, and FIGS. 2A, 2B, and 2C that describe common surround sound systems. See also Cols. 1 and 2 that describe these systems. None of these systems provide for panning through ***more than two speakers on one or the other side of an audience***, that is of at least one listener at unknown location, to provide the illusion of sound moving along the side of the listener, e.g., front to rear or rear to front ***while the listener is facing the front***. Abel describes a very complex amplitude panning that provides not only the location of a small source, but also of a source having width.

Applicant has already admitted that using amplitude weighting between two or more speakers to produce the illusion of a sound coming from between the speakers is known. **However, such panning is sensitive to the location of the listener.** Abel admits this in talking about the sweet spot (105 in Abel). ***That such amplitude weighting is position sensitive is one of the motivations for adding time delays. The Examiner has admitted that Abel does not show such delay. The examiner has also failed to show that Abel SUGGESTS such adding of time delays.*** That alone is sufficient to overcome a rejection based on combining these references.

A second cited reference is Horbach. Horbach does disclose time delays. However, as described throughout Horbach, starting with, for example, col. 1, lines 45 to 60, the Horbach application deals with time delays, weighting, and filters as applied to the left and right ears, e.g., to deal with transit time differences to the left and right ears, and not to rear-to-front and front-to-rear panning. See, for example, the way the locations of sounds are selected in col. 7, lines 1 to 15, and FIG. 8. The locating is more concerned with left to right rather than front to rear or rear to front. Furthermore, as seen in Horbach FIGS. 7 and 8, Horbach deals with accurately providing a sensation of an angle of arrival for the listener. With speakers fixed along the sides, that **necessarily means Horbach is for a listener at a fixed location.** Furthermore, when time delays are mentioned in Horbach's claims, Horbach clearly defines the transit time differences as "inter-aural transit time differences," again dealing with the listener being at a known location. The time delays of the present invention deal with time delays that could be applied only to one side, so do not even need two-ear sound listening. The present invention, for example, would provide the illusion to a one-eared listener. Furthermore, the present invention deals with providing a sensation of front-to-rear or rear-to-front movement for **an audience**, i.e., one or more listeners at unknown locations. The front-to-rear problem is not mentioned in Horbach. Horbach's solution is dependent on listener location, and nowhere in Horbach is there mentioned having a plurality of more than three left hand or right-hand speakers creating an illusion of front to back or back to front motion by simultaneously panning, i.e., weighting the signals to the speakers, and providing time delay of one speaker relative to another speaker on the same side to provide the illusion **independent of listener location.**

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Now the examiner has further cited a third reference, Callahan, that indeed does describe, e.g., in FIGS. 4 and 5 three speakers on either side of a theater. Callahan deals with how to include such additional surround sound signals in a conventional system that only has a left surround and a right surround signal in addition to the front left and front right (and front center) signals. Applicant has never stated that it is unknown to have more than two speakers on the side of a theater. It is in fact BECAUSE of this that the present invention is needed. The present invention deals with how to pan front to rear or rear-to-front for an audience using such a speaker arrangement. Callahan does not deal with solving this panning problem. Nor is there a suggestion of how to combine the other two references to yield Applicant's invention.

Thus, none of the references suggest **combining** both traditional amplitude weighting to achieve amplitude panning with time delays between three or more speakers on the side of a viewer to produce the illusion of front-to-rear or rear-to-front motion substantially independently of listener location.

The examiner has failed in the required burden of proof from a rejection under 35 USC 103.

Reversal of the rejection is hereby requested. The Application is believed allowable over the cited prior art.

For these reasons, and in view of the above amendment, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Conclusion

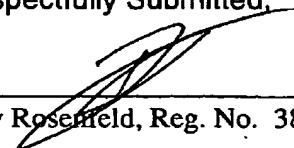
The Applicant believes all of Examiner's rejections have been overcome with respect to all remaining claims (as amended), and that the remaining claims are allowable. Action to that end is respectfully requested.

If the Examiner has any questions or comments that would advance the prosecution and allowance of this application, an email message to the undersigned at dov@inventek.com, or a telephone call to the undersigned at +1-510-547-3378 is requested.

Respectfully Submitted,

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Date


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